REMARKS

The Office Action dated November 3, 2008 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1, 5, 8, 11, 12, 15, 20, 22, 24 and 26-29 have been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added. Claims 1-17 and 20-33 are presently pending

Claims 1, 5, 6, 15, 16, 20-24 and 26-29 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haas (U.S. Patent No. 6,304,556) in view of Liu (U.S. Patent No. 6,980,537). The Office Action took the position that Haas discloses all of the elements of the claims with the exception of first-tier-mesh operational characteristics and second-tier-mesh operational characteristics being different. This rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claim 21 is dependent, recites a system including a first-tier mesh formed of a plurality of first-tier nodes. Each of the first-tier nodes of the plurality of first-tier nodes are configured to communicate data within the first tier with at least selected others of the first-tier nodes. At least one of the first-tier nodes forms a first-tier sink node. The system also includes at least a second-tier mesh formed of a plurality of second-tier nodes. Each of the second-tier nodes of the plurality of second-tier nodes is configured to communicate data within the second tier with at least selected others of the second-tier nodes, and at least one of the second-tier nodes forms a second-tier sink node.

The second-tier sink node is further configured to communicate with the first-tier sink node of the first-tier mesh. The system is configured to provide radio communication of data therein. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operational characteristics. The first-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 5, upon which claims 6-7 are dependent, recites a system including a first-tier mesh formed of a plurality of first-tier nodes. Each of the first-tier nodes of the plurality of first-tier nodes is configured to communicate data within the first tier with at least selected others of the first-tier nodes. At least one of the first-tier nodes forms a first-tier sink node. The system also includes at least a second-tier mesh formed of a plurality of second-tier nodes. Each of the second-tier nodes of the plurality of second-tier nodes is configured to communicate data within the second tier with at least selected others of the second-tier nodes. At least one of the second-tier nodes forms a second-tier sink node. The second-tier sink node is further configured to communicate with the first-tier sink node of the first-tier mesh. The first-tier mesh comprises an ad-hoc mesh which exhibits an ad-hoc configuration and an ad-hoc number of first-tier nodes. The system is

configured to provide radio communication of data therein. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operational characteristics. First-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The second-tire-mesh operates and communicates according to at least one of a point-to-point-mesh architecture and a pre-configured-mesh architecture.

Claim 8, upon which claims 9-10 are dependent, recites a system which includes a first-tier mesh formed of a plurality of first-tier nodes. Each of the first-tier nodes of the plurality of first-tier nodes configured to communicate data within the first tier with at least selected others of the first-tier nodes, at least one of the first-tier nodes forming a first-tier sink node. The system also includes at least a second-tier mesh formed of a plurality of second-tier nodes. Each of the second-tier nodes of the plurality of second-tier nodes configured to communicate data within the second tier with at least selected others of the second-tier nodes. At least one of the second-tier nodes forming a second-tier sink node. The second-tier sink node is further configured to communicate with the first-tier sink node of the first-tier mesh. The second-tier mesh includes a pre-configured mesh which exhibits a fixed configuration and a fixed number of second-tier nodes. The system is configured to provide radio communication of data therein. The first-tier nodes of said first-tier mesh operate and communicate based on first-tier-mesh operational characteristics The second-tier nodes of the second-tier mesh operate and communicate

based on second-tier-mesh operational characteristics. First-tier-mesh operational topological characteristics and a second-tier-mesh operational topological characteristics are different. The first-tire-mesh operates and communicates according to at least one of a point-to-point-mesh architecture and an ad-hoc-mesh architecture.

Claim 11, upon which claims 12-14 are dependent, recites a system that includes a first-tier mesh formed of a plurality of first-tier nodes. Each of the first-tier nodes of the plurality of first-tier nodes are configured to communicate data within the first tier with at least selected others of the first-tier nodes. At least one of the first-tier nodes forms a first-tier sink node. The system further includes at least a second-tier mesh formed of a plurality of second-tier nodes. Each of the second-tier nodes of the plurality of second-tier nodes configured to communicate data within the second tier with at least selected others of the second-tier nodes. At least one of the second-tier nodes forming a second-tier sink node. The second-tier sink node is further configured to communicate with the first-tier sink node of the first-tier mesh, and a third-tier mesh formed of a plurality of third-tier nodes. Each of the third-tier nodes of the plurality of third-tier nodes is configured to communicate data with at least selected others of the third-tier nodes. At least one of the third-tier nodes forms a third-tier sink node. The system is configured to provide radio communication of data therein. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operation characteristics. A first-tier-mesh operational topological characteristic

and a second-tier-mesh operational topological characteristic are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 15, upon which claims 16-17 are dependent, recites a system including a first-tier mesh formed of a plurality of first-tier nodes. Each of the first-tier nodes of the plurality of first-tier nodes is configured to communicate data within the first tier with at least selected others of the first-tier nodes. At least one of the first-tier nodes forms a first-tier sink node. The wireless access network also includes at least a second-tier mesh formed of a plurality of second-tier nodes. Each of the second-tier nodes of the plurality of second-tier nodes is configured to communicate data within the second tier with at least selected others of the second-tier nodes, at least one of the second-tier nodes forms a second-tier sink node, the second-tier sink node is further configured to communicate with the first-tier sink node of the first-tier mesh. The at least one of the first-tier nodes forming the first-tier sink node comprises a first first-tier node forming a first first-tier sink node and at least a second first-tier node forming a second first-tier sink node. The at least one of the second-tier nodes which forms the second-tier sink node includes a first second-tier node forming a first second-tier sink node and at least a second, second-tier node forming a second second-tier sink node. The first first-tier sink node is configured to communicate with the first second-tier sink node. The second first-tier sink node is configured to communicate with the second second-tier sink node. The first and

second second-tier sink nodes, respectively, are configured to communicate therebetween. The system is configured to provide radio communication of data. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operational characteristics. First-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 20 recites a method including forming a wireless access network providing for communication therein. The method further includes forming a first-tier mesh of a plurality of first-tier nodes, each of the first-tier nodes configured to communicate data within the first tier with at least selected others of the first-tier nodes, at least one of the first-tier nodes forming a first-tier sink node. The method also includes forming a second-tier mesh of a plurality of second-tier nodes, each of the second-tier nodes of the plurality of second-tier nodes configured to communicate data within the second tier with at least selected others of the second-tier nodes, at least one of the second tier nodes forming a second-tier sink node further configured to communicate with the first-tier sink node of the first-tier mesh formed during the operation of forming the second-tier mesh. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-

mesh operational characteristics, and the second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operational characteristics, first-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics being different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 22, upon which claims 3, 4, 6, 7 and 23 are dependent, recites an apparatus that includes at least one first-tier node. The at least one first-tier node is configured to form a first-tier mesh, and the apparatus is configured to communicate data within the first tier with at least selected others of the at least one first-tier node and to communicate data with a second-tier sink node of a second-tier network. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operational characteristics. First-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 24, upon which claim 25 is dependent, recites an apparatus that includes at least one second-tier node. The at least one second-tier node is configured to form a

second-tier mesh. The apparatus is configured to communicate data within the second tier with at least selected others of the at least one second-tier node and to communicate data with a first-tier sink node of a first-tier mesh. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operational characteristics. First-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 26 recites an apparatus that includes at least one first-tier node. The at least one first-tier node is configured to form a first-tier mesh. The apparatus further includes means for communicating data within the first tier with at least selected others of the at least one first-tier node. The apparatus also includes means for communicating data with a second-tier sink node of a second-tier network. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operation characteristics. First-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh

architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 27 recites an apparatus that includes at least one second-tier node. The at least one second-tier node is configured to form a second-tier mesh. The apparatus further includes means for communicating data within the second tier with at least selected others of the at least one second-tier node, and means for communicating data with a first-tier sink node of a first-tier mesh. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh are operational pursuant to second-tier-mesh operational characteristics. First-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 28, upon which claims 30-33 are dependent, recites a method including forming a first-tier mesh using at least one first-tier nodes. The method also includes communicating data within the first tier with at least selected others of the at least one first-tier nodes. The method further includes communicating data with a second-tier sink node of a second-tier network. The first-tier nodes of the first-tier mesh operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operational

characteristics. First-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

Claim 29 recites a method including forming a second-tier mesh using at least one second-tier node. The method also includes communicating data within the second tier with at least selected others of the at least one second-tier nodes, and communicating data with a first-tier sink node of a first-tier mesh. The first-tier nodes of the first-tier mesh are operate and communicate based on first-tier-mesh operational characteristics. The second-tier nodes of the second-tier mesh operate and communicate based on second-tier-mesh operational characteristics. First-tier-mesh operational topological characteristics and second-tier-mesh operational topological characteristics are different. The first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture.

As will be discussed below, Haas and Liu fail to disclose or suggest all of the elements of the claims, and therefore fails to provide the features discussed above.

As discussed in the previous Response, Haas discloses two network communication protocols, one for routing and one for mobility management, that are suited for use with ad-hoc networks. The routing protocol is a proactive-reactive hybrid

routing protocol that limits the scope of the proactive procedure to the node's local neighborhood. Routing zones are defined for each node that include nodes whose distance from the subject node in hops is at most some predefined number, referred to as the zone radius. Each node is required to know the topology of the network within its routing zone only.

The Office Action admitted that Haas does not disclose each of the features recited in the claims (see last 2 lines of page 2 of the Office Action dated November 3, 2008. Applicants agree that Haas is deficient with respect to the pending claims. However, Applicants disagree that Liu cure the deficiencies of Haas with respect to the claims. For instance, Liu and Haas fail to disclose "first-tier nodes of said first-tier mesh operate and communicate based on first-tier-mesh operational characteristics, and...second-tier nodes of said second-tier mesh operate and communicate based on second-tier-mesh operational characteristics...wherein the first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture, as recited in part, in independent claim 1 and similarly in independent claims 1, 5, 8, 11, 15, 20, 22, 24 and 26-29 (emphasis added). Although, claims 5 and 8 recite specified certain mesh architectures for at least one of the two mesh networks, those claims also recite that the first and second mesh networks are different. Regardless of the differences between the independent claims, Haas and Liu do not disclose the features recited in any of the independent claims.

The admitted deficiencies of Haas are described above. Liu discloses a system and method for cluster formation within a communications network by utilizing network topology information to designate network nodes that are crucial for relaying traffic as cluster head nodes, while the remaining network nodes are designated as member nodes. Liu adjusts a node status packet transmission rate or interval between successive node status packet transmissions to facilitate cluster formation independent of network size and varying initial start times of network nodes. This cluster formation is utilized to form a three-tier architecture for transmission or flooding of routing information from head node databases throughout the network.

Liu, like Haas, does not disclose any elements which correspond to the different topological characteristics in the manner prescribed by the claims. Furthermore, Liu does not disclose using more than one type of mesh network architecture. Liu is limited to using different frequencies as the sole functional difference between the operating conditions of the different mesh networks (see column 6, lines 49-58 of Liu). The topologies used in the different-tier networks of Liu do not provide different operational topological characteristics between the individual tiers, and, certainly, are not different mesh architectures.

Referring to FIG. 1A of Liu, wireless networks 2 having a plurality of nodes 10 are illustrated as being arranged in cells or clusters 12. The combination of clusters 12 form a first tier of the network 2. As can be clearly observed from FIG. 1A, each of the clusters 12 are based on the same network architecture and network configuration. The

first tier of FIG. 1A translates to the first tier illustrated in FIG. 8. The first tier 150 includes a plurality of nodes 10(1-11). Among the nodes 10, nodes 10(3), 10(6) and 10(9) are selected as being second tier nodes (i.e., head nodes 14(3), 14(6) and 14(9)) that provide routing services to other network nodes. This scenario is best described with reference to the third tier of a single super node 15(6) that distributes routing information to the lower-tiered head nodes in order to route the information across the network. In operation, the super node 15(6) will flood the head node databases with routing information and will continue providing that information upon request by the head nodes (see Abstract and FIG. 9 of Liu).

The three-tier architecture of Liu is simply a logical illustration of the routing hierarchy included within the physical constraints of a simple network topology. As is illustrated in FIG. 8 of Liu, there is only one physical network topology and, in turn, there can only be one network architecture. The head nodes and super node are mere labels given to the nodes that operate administratively within the physical constraints of a single architecture for a given network topology.

Liu does not disclose "first-tier nodes of said first-tier mesh operate and communicate based on first-tier-mesh operational characteristics, and...second-tier nodes of said second-tier mesh operate and communicate based on second-tier-mesh operational characteristics...wherein the first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh

architecture, as recited in part, in independent claim 1 and similarly in independent claims 1, 5, 8, 11, 15, 20, 22, 24 and 26-29. At best, Liu discloses a single network topology with multiple levels of authority given to certain network nodes. The differences between the authority levels of the regular, head and super nodes of Liu are not comparable to the differences between different mesh network architectures. Because Liu does not disclose different mesh network architectures, certainly, Liu does not disclose one network being at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture and a second network being a different one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture, as recited in the pending claims.

In addition to the above noted deficiencies of Liu, the teachings of Liu teach away from a pre-configured mesh with a fixed configuration because the configuration of Liu is a dynamic network configuration. Column 14, lines 27-61 of Liu describes how a dynamic tier forming system operates by continually forming the head nodes and super nodes of the second and third-tiers, respectively. This dynamic tier forming system of Liu teaches away from the fixed network configuration of claim 8. It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). Therefore, Liu may not be combined with Haas to teach the subject matter of claim 8.

Accordingly, Haas and Liu, taken individually or in combination, fail to disclose or suggest all of the elements of independent claims 1, 5, 8, 11 15, 20, 22, 24 and 26-29.

By virtue of dependency, those claims dependent thereon are also allowable. Withdrawal of the rejection of claims 1, 3-6, 8, 9, 11-13, 15-17, 20-30 and 32 are respectfully requested.

Claims 4, 7, 10, 14 and 31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haas in view of Liu and further in view of Acampora (U.S. Patent No. 6,751,455). The Office Action took the position that Haas and Liu discloses all of the elements of the claims except for co-located first and second tier nodes and other features recited in the claims. The Office Action then relied on Acampora as allegedly curing those deficiencies of Haas and Liu. This rejection is respectfully traversed for at least the following reasons.

Haas and Liu are discussed above. Acampora discloses a radio link management system for a home or office including an ad hoc network of agents wirelessly communicating among themselves, while clients wirelessly communicate with proximate agents. Control of the network may be centralized in a network controller integrated with an agent, or may be distributed upon the network of agents. Some of the agents, which may include an agent that is also the network controller, serve as a gateway device which connects to a worldwide communications network external to the home or office. Parameters for radio communication are allocated ad hoc in a manner which is client-dependent, and uses the least power from the battery-powered client. The agents establish an ad-hoc network among themselves, with routing among and between the agents being both multi-hop and "minimum hop" to conserve bandwidth.

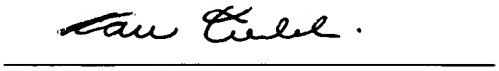
Claims 4, 7, 10, 14 and 31 are dependent upon claims 1, 5, 11 and 28, respectively. As discussed above, Haas and Liu fails to disclose or suggest all of the elements of claims 1, 5, 11 and 28. Additionally, Acampora does not cure the deficiencies in Haas and Liu, as Acampora also fails to disclose or suggest "first-tier nodes of said first-tier mesh operate and communicate based on first-tier-mesh operational characteristics, and...second-tier nodes of said second-tier mesh operate and communicate based on second-tier-mesh operational characteristics...wherein the first-tier-mesh and the second-tire-mesh operate and communicate according to different mesh architectures based on at least one of a point-to-point-mesh architecture, a pre-configured-mesh architecture and an ad-hoc-mesh architecture", as recited, in part, in independent claim 1 and similarly in the other pending independent claims 1, 5, 8, 11, 15, 20, 22, 24 and 26-29. Therefore, the combination of Haas, Liu and Acampora fails to disclose or suggest all of the elements of claims 4, 7, 10, 14 and 31. Furthermore, claims 4, 7, 10, 14 and 31 should be allowed for at least their dependence upon claims 1, 5, 11 and 28 and for the specific limitations recited therein.

For at least the reasons outlined above, Applicants respectfully submit that the cited prior art fails to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1, 3-17 and 20-33 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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